Hobbies WEEKLY

CONTENTS

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A TABLE TOP

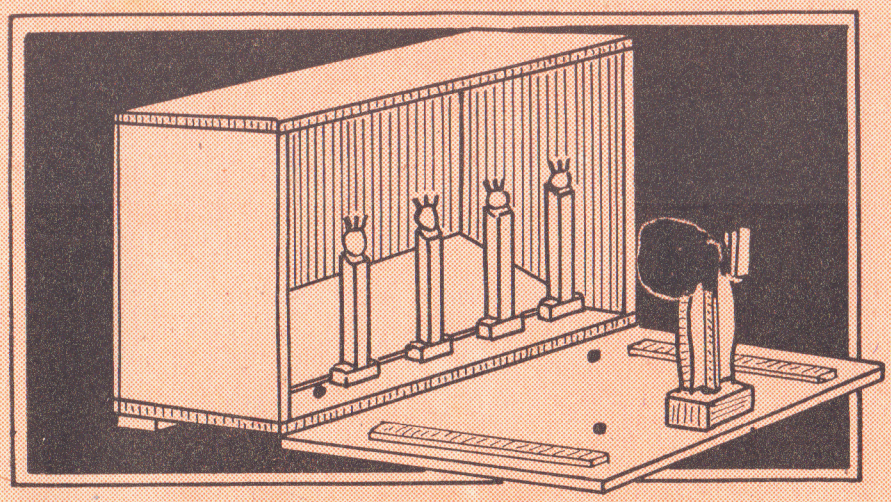
COCONUT SHY

IN spite of the many amusements to be seen now at our fun fairs, the coconut shy seems to lose nothing of its old attraction, and is as popular as ever. The little table-top model shown here, therefore, is likely to provide a good deal of amusement for young and old, and is not difficult to make up.

Small ball-bearings about ½in. in diameter (obtainable from most cycle shops) provide the missiles, and they are aimed at the model coconuts from a movable cut-out figure, the arm of which is operated by elastic. The miniature coconuts are cut from wood, and are mounted on sturdily-made supports to withstand a heavy barrage. When not in use the whole game folds up into a neat box, which prevents any of the pieces from getting mislaid.

Materials Required

The measurements given make up a shy that is 8½ins. high and 12ins. wide, and accommodates four coconuts; but the exact size is immaterial, and can, of course, be varied to suit whatever wood the handyman may have by him. Wood of ¼in. thickness is allowed for throughout, except for the stands, which are cut from a piece of 1½ins. by ½in. An oddment of ½in. dowel is needed to make the coconuts, and for the base of the cut-out figure a short piece of ½in. dowel and a block of wood about 1½ins. square and ¼in. thick. If preferred, stout cardboard reinforced at the corners may be used for the case, but stout plywood is necessary for the cut-out figure, since this must be as strong as possible.



The Case

Make a start with the case. Fig. 1 shows how this is assembled. Two pieces each 12ins. by 6ins. are required for the top and bottom; two pieces each 7½ins. by 6ins. for the ends; and two pieces 12ins. by 8ins. for front and back. It will be seen from Fig. 1 that the front is hinged on; and to keep the box level when the box is open and the game in progress a strip of the same material is glued along the back bottom edge, as shown. Before assembling the bottom, however, mark and cut out four slits for the stands, each ¾in. square, at equal distances along the front and 1½ins. from the front edge. These will be seen at Fig. 1.

To facilitate the return of the balls, a piece of wood 11½ins. by 3½ins. is fixed at a slight angle on to the inside bottom of the case, behind the stands, as shown, and if thin strips are glued along the outside edges of the lid, just far enough in to allow the lid to be closed, this also helps to prevent the balls from rolling off the table.

The Coconuts and Stands

Four miniature coconuts can be easily made from pieces of ½in. dowel. First cut off four pieces each 1in. long and round one end smoothly. Make three or four

sawcuts downwards from the other end, for ⅜ths of an inch, then with a sharp knife (and a little patience) whittle each of the pieces into the shape of the hairy coconuts as exhibited for our amusement at the fairground.

To make a strong job of the stands they are best cut out of the solid, as shown at Fig. 3. First cut four pieces of 1½ins. by ¾in. to a length of 4½ins. Mark

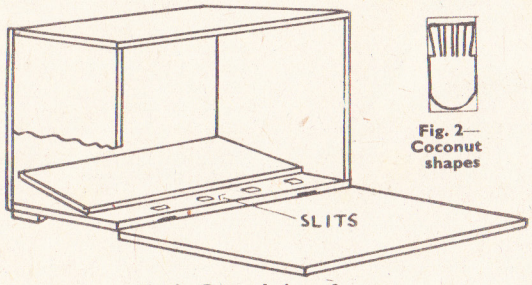


Fig. 1—General view of carcase

Fig. 2—Coconut shapes

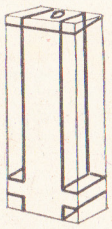


Fig. 3—The stand

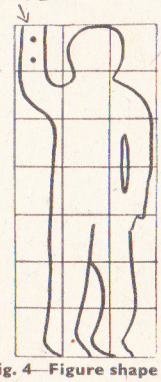


Fig. 4—Figure shape

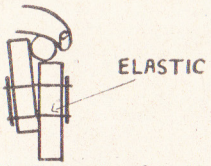


Fig. 5—Section of working

CUTTING LIST

No. of Pieces	Description	Size
2	Cases, top and bottom	12″ × 6″ × ¼″
2	Cases, ends	7½″ × 6″ × ¼″
2	Cases, front and back	12″ × 8″ × ¼″
1	Case, slanting base	11½″ × 3½″ × ¼″
4	Coconuts	1″ × ½″ dowel
4	Coconut stands	4½″ × 1½″ × ¾″
1	Cut-out figure	3½″ × 1½″ × ½″
1	Cut-out arm piece	1″ × ⅜″ × ¼″
1	Cut-out strut	3″ × 1½″ × ¼″
1	Cut-out dowel	¾″ × ½″ dowel
1	Cut-out block	1½″ × 1½″ × ¾″

them out ⅜ths from each edge, then saw down as shown, to make pillars ¾in. square but leaving a shoulder the full 1½ins. wide ¼in. from the bottom end.

Fit these into the four holes cut for them in the bottom of the case, but do not glue them in until the cups have been done. To make these cups, first bore with ½in. bit a hole about ½in. deep, from the top end. Cut off the top at a slight angle, as shown, then with knife and glasspaper finish off the tops into bowls in which the coconuts will rest (but not too firmly—or the competitors may come to have the same suspicions that we ourselves get when the nuts at the fair seem to be glued in!).

The Cut-out Figure

One suggestion for the little cut-out figure is given at Fig. 4, ruled in ½in. squares for copying. Cut this out in plywood, the thicker the better. Drill two holes in the top of the upraised arm, as shown, and cut a small piece to fit behind and slightly higher than this arm, as shown at Fig. 5.

This piece is also drilled with two holes corresponding to those in the arm. Now with a strong elastic band fix the two together, holding the elastic in place with matchsticks on either side, as shown. A little experimenting here is well worth the time taken, to ensure a good throw for the balls. The elastic should be as strong as possible, and fixed short enough to allow of only a little play between the two pieces of wood.

On the other hand it must not be too tight, or the strain of flinging the balls will break it after a time or two. With a little practise it will soon be found just how the elastic needs to be to throw the balls at the correct range and with the right degree of force to dislodge the coconuts when they are hit.

A narrow strut ½in. wide and 3ins. long is glued to the back of the figure, projecting at the bottom for a ½in. Now cut a piece of ½in. dowel to a length of about ¾in., and in it make a slit ¼in. deep. The projecting end of the figure-strut is glued into this, as seen at Fig. 6.

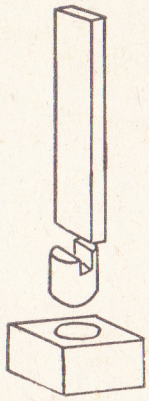


Fig. 6—Base and strut

Cut a block of wood 1½ins. square and about ¾in. thick and bore it at the centre to a depth of ½in. with a ½in. bit. Glue this block on to the lid of the case, in the position where the figure will stand when in use. This then acts as a stand for the figure, the projecting end of the dowel fitting into the ½in. hole; and in this way enabling the figure to be turned round as required for aiming the balls at any of the coconuts.

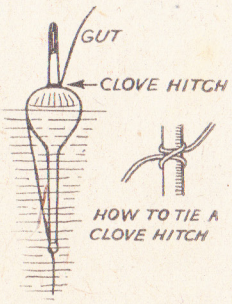
Storage

When not in use the figure will, of course, be lifted out of this block and stored in the case with the coconuts and balls.

Finish off the case and figure with stain or gay-coloured enamels, as preferred, and fix a small fastener on to the lid of the case, to hold it closed when not in use. (353)

Substitute Float Caps

THIS tip will be useful to those who go in for float fishing. If the small cap has been lost off the top of the float, the



best thing to do is to tie a clovehitch in the gut after oiling it, then just slip it over the top of the float and pull tight. This will hold very well and is very neat.

Water Stain

MANY fretworkers use water stains for staining their wood, and find that the stain takes a very long time to dry, and is a totally different colour from what it was when wet.

This can be rectified by putting a few pulverised crystals on a rag which is made into the form of a pad, and applying a small amount of water. Rub in, like polish, and a smooth, even colour will be obtained, on which polish may be applied almost at once.

To Remove Fingermarks

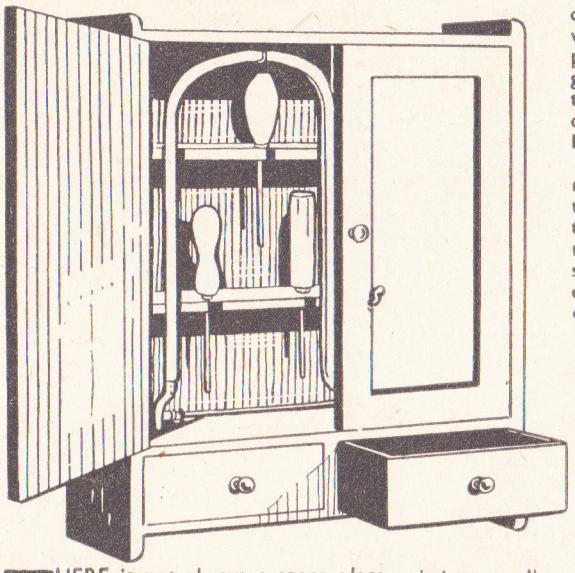
FINGERMARKS can be effectively removed from doors in the following manner. Rub the marks with clean piece of flannel dipped in paraffin oil. Afterwards wipe with clean cloth wrung out in hot water to take away the smell. This is better than using soap and water, as it does not destroy the paint. Paraffin oil is also excellent for cleaning varnished doors outside, which face the dust and rain.

Paperhanging Hints

AMATEURS will find their task a much easier one if they apply their paste to the wall instead of the paper, which is apt to tear and give trouble. When it is necessary to put a patch on Wallpaper, instead of trying to match the pattern, put the new piece on square and neat, tear it roughly and paste securely, and the rough edges escape notice.

A useful addition to any workshop is this fitted

HANGING TOOL CHEST



THERE is not always a spare place for the handyman's chest of tools, and if there is, the chest frequently has a host of odds and ends stood upon it, making for loss of time and temper when a job is required to be done at short notice.

On the other hand, space upon a wall for a hanging cabinet of tools can generally be found, and the inconvenience mentioned thereby obviated. All tools need to be kept in good condition and should, therefore, have their own special places in racks or small drawers purposely arranged for them.

Such tools, however, as hammers, clamps, pincers and a number of others of the heavier type, of course, will stand rough usage and may thus not need quite so careful attention.

The thoughtful workman, for instance, would never allow his chisels to lie about with files and rasps, nor pointed tools such as gimlets, drills and awls to get mixed up with odds and ends in a tool box or drawer.

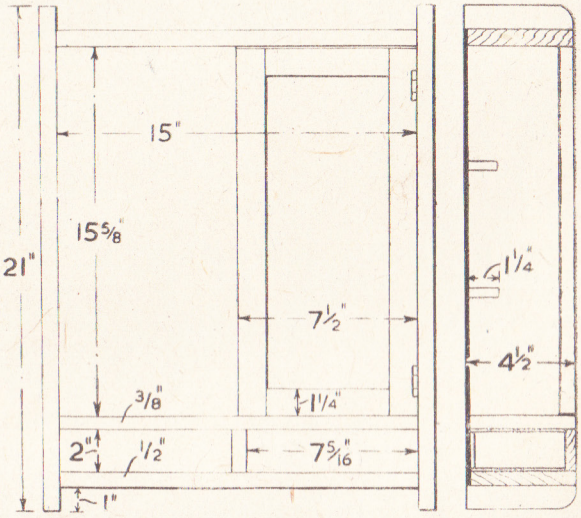
By having proper racks and chosen positions for each tool in the racks, there should never be time lost in searching around, and one can always be sure of the edges and points being well preserved, that is, of course, if due care is taken in the actual handling.

Now, a hanging cabinet for tools will have to be strongly constructed, more so, perhaps, than a chest where the weight is more or less wholly supported by the floor.

Care should at the outset be taken to choose only those tools for hanging in the cabinet which are really essential, and which are most generally used for light carpentering jobs in the house as well as, of course, for the favourite hobby of fretwork.

For All Tools

The most useful type of hanging cabinet is that shown in the sketches where ample racks are provided for ten or so edged tools and shelf space for smaller articles. The top portion is enclosed by a pair of doors, while immediately underneath there are two



Figs. 1 and 2—Front and side view showing parts and dimensions

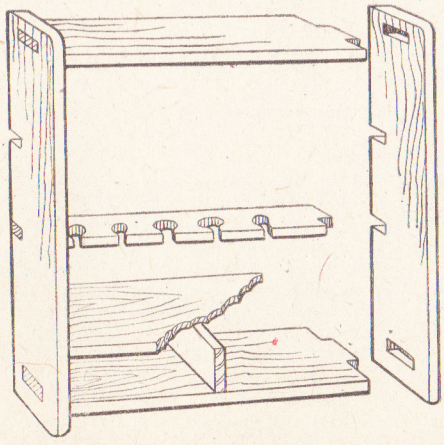


Fig. 3—Construction of carcase

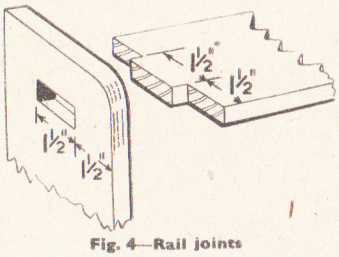


Fig. 4—Rail joints

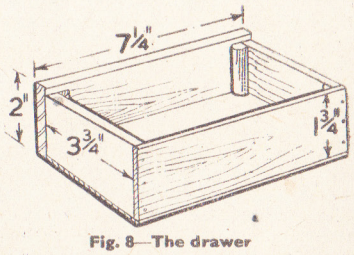


Fig. 8—The drawer

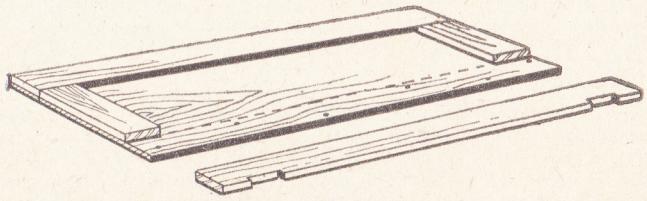


Fig. 7—Door construction

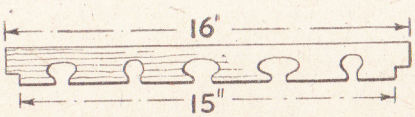


Fig. 5—The tool rack

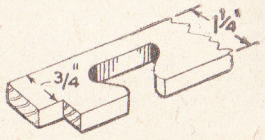


Fig 6—The tool slots

useful drawers or small articles such as fretsaws, drills, saws, and small screws and nails. A very useful position is chosen for a 12in. fretwork handframe.

A good idea of the interior space and the general arrangement of the parts may be got from Fig. 1 which shows only one door and the spaces to be occupied by the two drawers.

Fig. 2 gives a section through the cabinet showing the suggested positions of the racks, etc.

General Construction

Fig. 3 shows the general construction, a portion of the floor of the cabinet being cut away to show the cross partition separating the drawers. Figs. 4, 5 and 6 show details of the joints adapted for the shelves and racks, and also the openings cut in the latter for the tools. Fig. 7 gives the construction of the doors, and Fig. 8 one of the drawers with a view taken from the back of same.

A suitable wood for the cabinet is deal throughout, with plywood for the main back and for the floors and backs of the drawers. The plain screwed or nailed butt joint is hardly strong enough for holding the main sides to the lower floor and top, and the ordinary open tenon joint, shown in Fig. 4 has, therefore, been used. The weight of the tools, too, is taken directly by the sides, the rack ends being slotted, as in the detail Fig. 6.

The Sides

In setting out the sides, therefore, two pieces measuring 21ins. by 4½ins. by ½in. thick must be marked off to the several dimensions given in Fig. 1, notice being taken that the floor of the cabinet which is ⅜in. thick is not tenoned through, but is supported by the mid partition and screws through the sides. Two pieces measuring 16ins. by 4⅜ins. wide by ½in. thick will be wanted for top and lower floor with tenons 1½ins. wide and spaced 1½ins. from front edges, as in Fig. 4.

The front edges of these four sections must be kept flush, the ⅛in. to spare at the backs of the 'shelves' being occupied later by the ⅛in. plywood back. Fig. 2 clearly shows this arrangement. See that all the tenons fit tightly, so when the pieces are knocked together they stand rigidly, while the other pieces are being set out and fitted.

Mark out and cut in the slots in the sides ¾in. long and ⅜in. wide, and make the two racks to fit these, as Fig. 5, the openings for the tools being, of course, cut to fit each as required.

Assembly

All the parts may now be finally fitted and then glued together and the cross partition, measuring 4⅜ins. long by 2ins. wide by ⅜in. thick, set across centrally with the floor of the cabinet laid across this again and screwed through the sides. The floor is 15ins. by 4⅜ins. by ⅜in. thick. At this stage the corners of the sides should be rounded off and glasspapered smooth with the sharp edges of the shelves and sides taken away.

The doors consist of two pieces of 5/16in. thick wood with upright and cross rails of ⅜in. deal screwed and glued to the face, as Fig. 7. The screws are put through the wood panel and run into the rails, care being taken not to let the points of the screws come through on the face of the doors. Cut shallow recesses 1½ins. long to take the hinges in the two side upright rails, as shown in Figs. 1 and 7.

Door Rails

Use a fine tooth tenon saw when cutting off the short rails of the doors, or better still, use a fretsaw which will give the finest possible joint between the rails when they are laid on the door panels and glued up. Clean off the edges of the doors, and after hinging them, put on ball catches and a suitable knob.

The back of the cabinet consists of a sheet of thin wood 17ins. long by 15ins. wide. This may be made up in two or more narrow widths. Do not cut to these given sizes but take the exact measurements from the job direct. Screw the backing to the back edges of the floors and top and bottom racks.

Drawers

The drawers are of very simple construction, as detail Fig. 8 shows. The measurements for each part is given and the quarter beading to be glued into the corners for strengthening clearly shown. The fronts and sides of the drawers are ⅜in. thick, the back and floor of ⅛in. or 3/16in. plywood. Clean up all the woodwork of the drawers and see that they fit closely but not stiffly.

The whole of the cabinet should be cleaned up and glasspapered, and all sharp edges taken off. Give one coat of lead paint priming, and finish with two coats of good oil paint. Put on two stout hanging plates and plug the wall with Rawlplugs to receive the fixing screws.

Answers to reader's problems on Electrical Queries

Changing Current

I HAVE recently moved, and the house is wired D.C. and I have an A.C. radiogram. Is it possible without going to too much expense, to get a rectifier to alter D.C. to A.C., or is there any other way? (T.G.W.—Ilford).

A.C. may readily be changed to D.C., but the reverse cannot be accomplished except by means of a rotary convertor. (A unit containing a motor to operate from the D.C. mains, driving a dynamo producing A.C.). These are rather expensive units, and you could write to Valradio, 57 Fortess Rd., N.W.5, giving full details of your requirements and ask for quotation. Most A.C. receivers can be modified to work from D.C. mains by using series connection for heaters, and omitting the transformer and rectifier circuit, but this modification can only be undertaken by a person with sufficient technical knowledge and the expense would render it undesirable if a radio shop had to be asked to make the necessary, fairly extensive changes. Receivers may be purchased suitable for use on both A.C. and D.C. mains.

Gramophone Drive

IS it at all possible to gear an electric motor to drive my clockwork gramophone? (F.B.—Bolton).

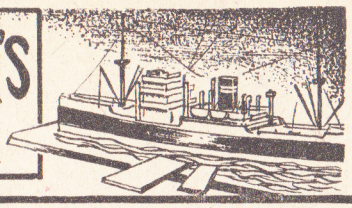
THERE is no reason why any electric motor should not be used to operate a gramophone turntable, provided it is sufficiently powerful. A high reduction ratio is required, and in ready-made electric gramophone motors this is usually obtained by worm-wheels. A light belt might be used, with gearing for the final reduction, and the turntable should revolve at 78 r.p.m. Most electric motors run at about 2,000 to 4,000 r.p.m. and a few experiments with different gear ratios may be necessary to find that required with your particular motor. A ratio of between 30 and 50 to 1 will normally be required.

Motor Trouble

I OBTAINED two electric motors but could not get these to turn, either with D.C. or A.C. Moreover, they stick when current is applied to them. (P.D.—Malta).

NORMAL repeater motors are not intended to drive any models or similar equipment in the usual way. In aircraft, such motors are used with one armature mechanically coupled to a directive loop aerial, and the other, situated at some distance (e.g., near pilot) fitted with an indicator. When one armature is rotated by external means, this causes fluctuation in the field coils of the second unit of such a kind that the rotation of the second, distant motor, armature follows that of the first. The indicator and loop, therefore, move in unison. It may prove impossible to get the motors to 'run' in the usual way, since they are not designed for this. D.C. is unsuitable. With A.C. some such motors will run provided they are given an initial spin, which must be of such a speed that one armature pole passes each field pole at a frequency which corresponds to the change in frequency of the A.C. supplies. (That is, as a synchronous motor). The revs. per minute necessary for such starting, may be calculated by dividing the number of armature poles into the frequency of the A.C. supply and multiplying by 60.

The SHIPMODELLER'S Corner



Standing Rigging for The Royal Sovereign

by 'Whipstaff'

AS our hull is now complete we start, what is to me, always one of the most interesting details of Ship Modelling, namely the rigging.

Assemble the masts as detailed in your kit design, add rings of gummed paper about $\frac{3}{32}$in. wide around the lower masts, space them $\frac{1}{2}$in. apart and paint dull black. These will simulate the mast bands. Glue masts in position and leave to set.

Next make all shrouds as in your instructions and erect them in position on the model.

If you would like to give the added touch of deadeyes on the shrouds and channels use a pair of long-nosed pliers and clip into position angler's small split shot. Paint black and at this small scale they will give the right effect.

Now follow our standing rigging sketch in numerical order. First, No. 1, our bowsprit gammoning, seizing this in the centre with fine thread.

The following rope is the mainstay No. 2. This is double and passes one each side of the foremast, through two holes drilled downwards through the beakhead bulkhead and secured to the heel of the bowsprit.

The next ropes are single. No. 3, the forestay; No. 4, the foretopmast stay and bridle; No. 5, the foretopgallant stay and bridle; No. 6, the fore royal stay; No. 7, the maintopmast stay; No. 8, the maintopgallant-stay; No. 9, the main royal stay; No. 10, the mizzen stay; No. 11, the mizzen topmast stay; No. 12, the mizzen topgallant stay.

The following ropes are repeated on each side of the ship, port and starboard, and are secured to eyelets in the deck, which we also use later for securing our running rigging ropes.

No. 13 and No. 14, the mizzen backstays; No. 15, No. 16, No. 17, No. 18, the main, maintopmast, main topgallant and main royal stays.

No. 19, No. 20, No. 21, the foretopmast, foretopgallant and fore royal stays.

Shrouds have been left off our sketch and backstays on one side only shown in order to make our small sketch easy to follow.

And now to our running rigging.

Before commencing to put in place our running rigging on our little model we must prepare the yards.

Take all square yards, finished to correct section and taper, and, having made some two dozen or so small eyelets from bank pins, we insert them with a touch of glue into the yards in the positions shown in Fig. 1.

Next cut off several bank pins, giving a length of $\frac{3}{8}$in. of the end. Glue these point outwards in tiny holes drilled in the centre of each yard. These are for pinning and gluing the yards to the masts.

Now we drill a small hole in the end of each yard, to run fore and aft when the yards are in position. These, together with the eyelets, are to carry our running rigging in place of blocks, which if made to exact scale, would be too small to be practical.

Stain all eyelets black, either chemically or by painting with 'Hobbies' egg-shell black, and, when dry, glue on sails to respective spars.

We now put a spot of glue around the pin point in each yard and press into position on the mast. They can then be left to allow the glue to harden.

The model will look better if the yards are trimmed and sails braced slightly to show the wind on the quarter. The position the yards will then occupy is shown in Fig. 2. This shows the set of the yards when looked at from above.

Our first rope is the spritsail - topmast yard brace. This we take from the forestay, through the tiny hole at the end of the yard, down through a small eyelet on the bowsprit to the top of the knighthead. As there is no knighthead on the beakhead deck of our small model, we secure this rope to a small eyelet fixed in the beakhead deck at the keel of the bowsprit. There must be one of these braces on each side of the ship, (A) in Fig. 3.

Our second ropes are the spritsail-topmast lifts, (B) in Fig. 3. Secure one end to a small eyelet in the spritmast top (crow's nest) and carry it through a small eyelet on the end of the sprit-topmast yard, down to a small eyelet on the spritsail yard and thence up to the point of the bowsprit, again one on each side of the ship.

Now take the outer brace (C) in Fig. 3 from the forestay, through the small hole at the end of the spritsail yard, up to the forestay and down to fasten to eyelet at the foot of bowsprit. The same eyelet to which we secured our first rope will again serve us here.

To save repetition, all ropes from now on must be duplicated on each side, port and starboard, unless otherwise stated.

The spritsail sheets go from the corner of the sail and are secured to a small eyelet at point (X1) on the hull.

Our next operation is that of rigging the foremast. (If you fix royals to the small yards shown at the top of the masts in Hobbies design, you must rig as for the other square sails, if not, merely show the royal yard lifts).

Your lifts go from the ends of the yard to the top of the mast for the royal yard, and as shown in Fig. 4 for the other yards. In actual practice they lead through various blocks and tackle to the deck, but at our small scale we will omit this, and take them down through a small eyelet in the side of the mast top and down to the screw eyes at the foot of the mast, which in our model take the place of the fife rails. (Do not forget, finer cord for the running rigging).

Fig. 4a shows all deck screw eyes and eyelets in position. At this small scale when the rigging is secured to the screw eyes they will have the appearance of fife rails, especially if painted black to make them less obvious.

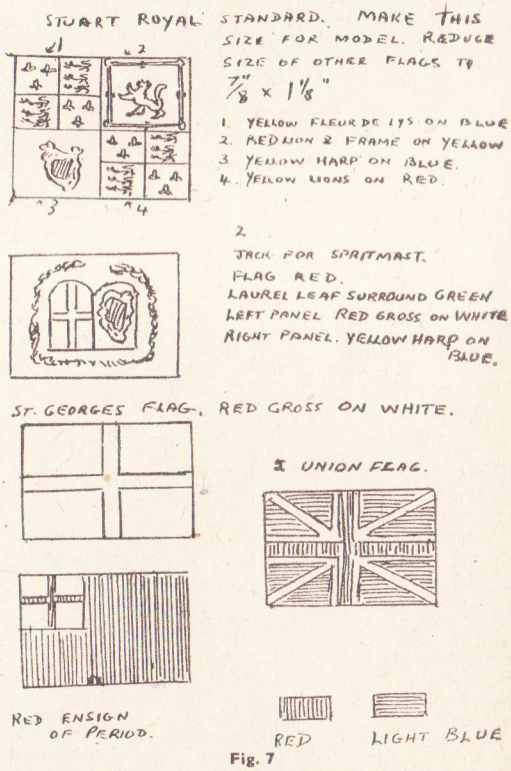
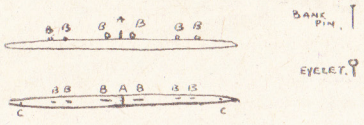


Fig. 7

Now turn to Fig. 4 and fit your clew lines on the sails, as shown, from point of sail, through the hole drilled in the end of the yard, up to the eyelet in the yard and down to the eyelet in the deck, just inside the bulwarks. Points of sail are better re-enforced as in small Fig. 4.

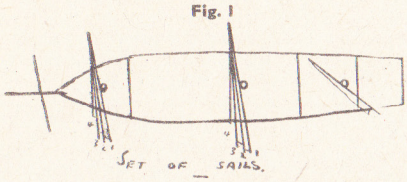
Next take your leech lines from the edge of sail, up through the eyelet in the yard and down to the second eyelet in the deck, next to that of the clew line. There are two leech lines on each side of the sail.

Follow this by taking the sheet of the sail from the corner, through the hole drilled in the end of the yard, along the yard, through the eyelet and down to the third eyelet in the deck, next to that of the leech lines.



A. PIN POINT B. EYELETS C. HOLES DRILLED.

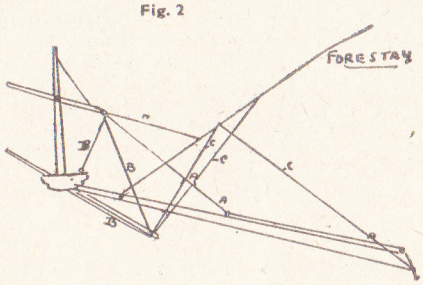
Fig. 1



SET OF SAILS.

1. FORE & MAIN SAILS. 2. FORE & MAIN-TOPSAILS
3. FORE & MAIN TOPGALLANT SAILS. 4. ROYALS

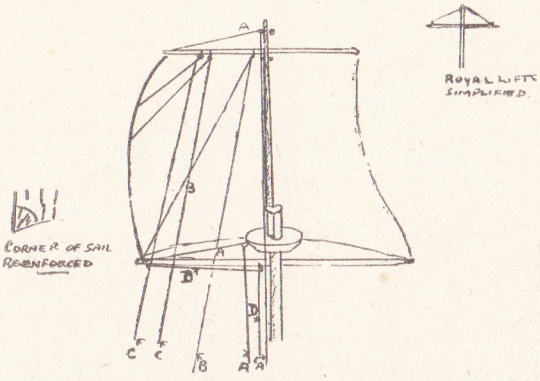
Fig. 2



A. SPRITSAIL TOPMAST YARD BRACE
B. SPRITSAIL TOPMAST LIFTS.
C. OUTER BRACE

REPEAT ALL ROPES ON BOTH SIDES OF SHIP

Fig. 3

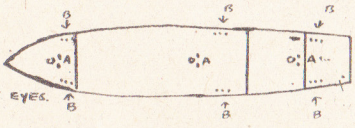


A. LIFTS. SHOWN ON EVERY YARD. FOR ROYAL YARD IT NEED NOT GO TO DECK. BUT CAN BE SHOWN AS IN SMALL SKETCH

B. CREW LINES. C. LEECH LINES

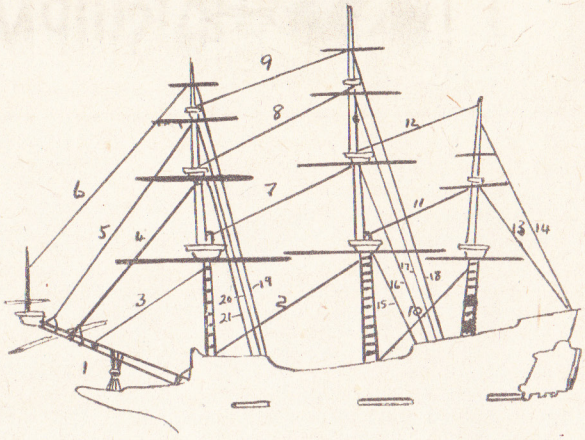
D. SHEET

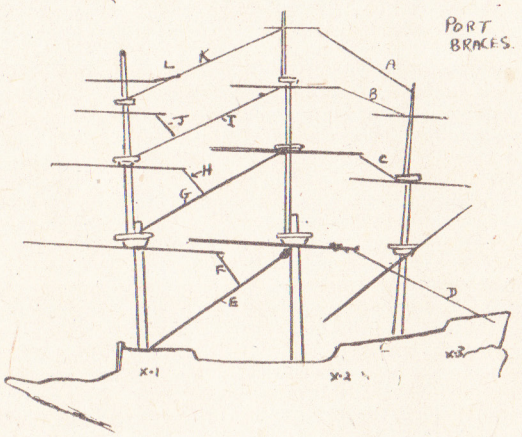
SKETCH 4A. POSITION OF DECK EYELETS & SCREW EYES



A. BRASS SCREW EYES.
B. EYELETS.

Fig. 4

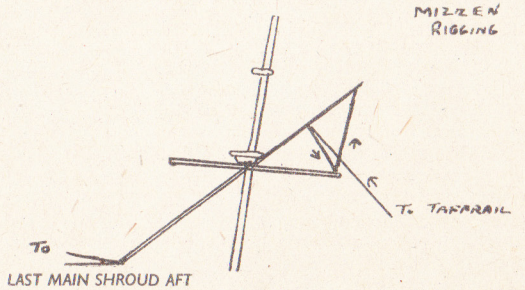




A. MAIN ROYAL BRACE. B. MAIN TOPGALLANT BRACE
C. TOPGALLANT BRACE. D. MAIN BRACE
E. MAINSTAY. F. FORE BRACE
G. MAIN-TOP STAY. H. FORE TOPMAST BRACE
I. MAIN TOPGALLANT STAY. J. FORE TOPGALLANT BRACE
K. MAIN ROYAL STAY L. FORE ROYAL BRACE

REPEAT ON STARBOARD SIDE.
ON SCALE MODELS THESE BRACES WOULD LEAD DOWN TO THE DECK.

Fig. 5



LAST MAIN SHROUD AFT

SHEET FROM CORNER OF SAIL TO EYELET IN DECK.

Fig. 6

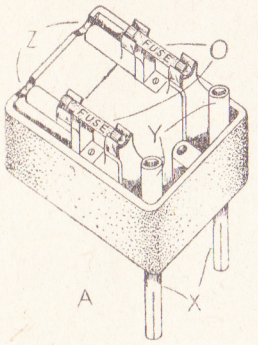
These rigging lines must be repeated on all the upper square sails, both on foremast, mainmast, and mizzenmast and on foresail and mainsail with the exception of the sheets. These go from the corner of the foresail and mainsail to

(*Continued foot of page 327*)

How the home electrician can undertake

REPAIRING FUSES

IN order to use electrical items such as wireless sets, irons, and reading lamps, off a plug which is used for heaters, it is advisable to make use of what is termed a safety adaptor. This adaptor is fixed into the heating wall plug socket, and allows for the heater to be used in the standard 15 amp. socket while the iron or reading lamp is used in the smaller 5 amp. socket. The safety adaptor is provided with two small cartridge fuses which are for the purpose of protecting small consumption apparatus.



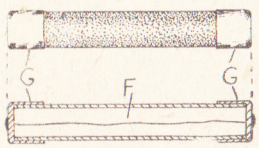


Fig. 1—A safety adaptor

One type of safety adaptor with the cover removed is indicated in view (A) Fig. 1, of the accompanying illustrations. Here we have standard 15 amp. plugs marked (X), which fit into the 15 amp. wall socket, and such apparatus as an electric fire is plugged into the 15 amp. socket (Y).

The 5 amp. outlet sockets into which is plugged an iron, reading lamp or wireless set, is indicated at (Z). The 5 amp. sockets are provided with two small cartridge fuses marked (O), and these fuses will break or blow if any fault occurs on the small apparatus.

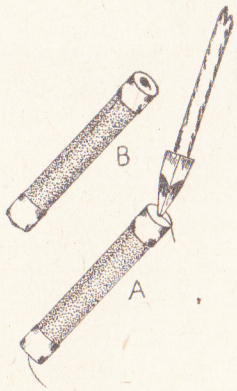


Fig. 3—Soldering repairs

The cartridge fuse is indicated quite clearly in view (B) Fig. 1, and a cross section of the cartridge shows the fuse wire marked (F) in position, connected to the soft metal ends (G). The fuse wire (F) can be renewed if found blown due to trouble on apparatus, and a simple way of doing the job is as follows.

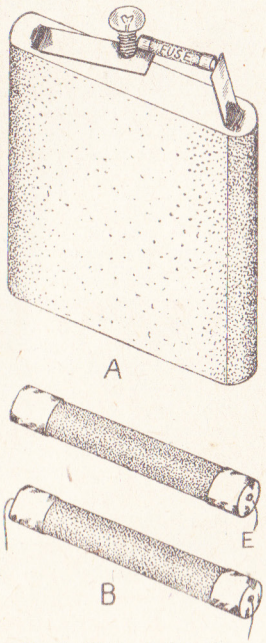


Fig. 2—Method of testing

First of all it is necessary to find out which fuse is blown, or in some cases both will be found blown.

A simple test to employ for finding the faulty fuse is indicated by view (A) Fig. 2. Use an ordinary flat type torch battery as indicated, hold the bulb with its end tip in contact with the long strip connection, and try the fuse with one end in contact with the other battery contact, and the other end touching the threaded side of the bulb, as clearly shown. If the cartridge fuse is in good condition the bulb will light up, provided, of course, the battery and bulb are sound. If, however, the fuse is faulty, the bulb will fail to light up.

Now take the faulty cartridge and make a small hole about $\frac{1}{32}$ in. in each end, as indicated at (E) view (B) Fig. 2. The ends of the cartridge are quite soft, and the holes can easily be made with the point of a small awl or small drill held in a pin vice. Obtain some 5 amp. tinned copper fuse wire and thread a piece through the holes made in the cartridge, as indicated in view (B) Fig. 2.

Usually the ends come off the fibre body fairly easily, and it is a good plan to slip the wire through one end and then take the other end off and pass the wire through, then refix the end on the fibre.

The fuse wire now in position must make a sound contact with the metal ends of the cartridge, and this is done by carefully soldering.

The soldering is best done with the point of a small iron and a piece of resin cored solder. Get the iron of the correct heat and well tinned, then apply a little solder on the end of the cartridge on the wire, as indicated in view (A) Fig. 3. Both ends are, of course, soldered and the finished job is left as indicated in view (B) Fig. 3.

Small cartridge fuses of this type can be repaired many times over if the job is carefully done in the first instance. (347)

Model Ship Building—(*Continued from page* 326)

points (X2) and (X3) on the outside of the hull, fastened to small eyelets.

The braces are our next consideration, and at our small scale we will not follow them right through to the deck, but just show sufficient to give the right effect, so as not to overcrowd our model with rigging.

Attach all braces as in Fig. 5. This shows, of course, only those on one side of the ship for simplicity.

Our final operation is to rig the mizzen lateen sail. All necessary rigging for this sail is given in Fig. 6.

And now to complete our model we need some flags. Owing to the frequent constitutional changes of this period the original vessel would have flown various sets of flags during her lifetime.

The set I have chosen would only be flown for a few months, but this would be about the time of her rebuild, at which period our model represents her.

The first we must paint is the Stuart Royal Standard to be flown at the stern flagstaff.

The second flag that we will show at the spritmast was only for a short time in use, but is very historic in that it saw service in many famous battles and was re-introduced to take the place of Cromwell's union jack on his son's abdication. It is picturesque and was flown by Montagu when he sailed to fetch home the exiled king in May, 1660.

It was superseded again when the actual Restoration caused the Navy to revert to the jacks used prior to 1648.

At the foremast we will fly the St. George's flag, at the main the flag of the union of this period, and at the mizzen the red ensign of this period.

The designs for these flags are shown in Fig. 7. At this scale they cannot be too detailed, but the effect can be achieved.

For those who like detail there were seven sets of gudgeons and pintles on the rudder of the actual ship.

We have now completed our little model and although the small scale made it essential to simplify such details as carving and rigging of this period, we have the effect that gives a real picture of the large warship of the period and an appearance that gives an authentic picture of the vessel and its rig, as our small scale will allow.

I hope you have enjoyed the creation of our model through its various stages and will be pleased to answer any queries sent to me care of our Editor.

If you have found added interest in building this model by the methods outlined, do not miss our future article dealing in the same way with other famous ships in our series of Kits.

The second and final details of scenic effects in

MODEL RAILWAYS

ONE of the most useful materials for making up an artificial ground level is plaster of paris, though, of course, either Keen's cement or builders' plaster are quite satisfactory for 'roughing up' on a sized brown paper substructure. Dental plaster, which is actually an extremely fine grade of plaster of paris, should find a ready use for really fine surface modelling, even very small buildings being produced by cutting it, whilst in a half-set state, with a penknife.

Mixing

There is an art in mixing plasters, and one of the secrets is the use of warm (not hot) water. If it is desired to give more working time between the mixing and the setting, the speed of hardening may be reduced by the addition of ordinary vinegar, the more of which is used in mixing, the slower will be the setting.

Thus, if one part of vinegar is mixed with the moistening water, setting will take place in about half-an-hour; if equal parts of vinegar and water are used, setting will take about two hours; whilst if all vinegar is used for the mix, six hours will be required. By this means, time is given for the manipulation of the plaster. The water and the vinegar should be mixed first, before pouring into the plaster.

Humps and soil heaps are easily represented by merely pouring the liquid plaster over a paper-covered wooden skeleton, the latter being made as described last week. Larger surfaces of rolling countryside are formed by tacking down rough sacking over the wooden skeleton and brushing this over with very liquid plaster. When the latter has set, more plaster can be daubed thereon and worked up into the desired shape.

Key the Plaster

To assist new plaster to adhere to older hard-set plaster, always thoroughly wet the old work with very liquid plaster, applied with a brush, applying the new work before this keying surface becomes dry.

To effect a good key between the railway baseboard and new plasterwork it is a good plan to drive some wire nails into the baseboard, leaving about half their length projecting above the surface. The plaster, when poured over, then will be firmly attached to the base, from which it may be levered as a unit, if desired.

Quick Setting

From the foregoing remarks it will be appreciated that whilst plaster of paris has a great advantage in speed of setting, papier mâché has the greatly desired quality of not splitting when it has to be drilled to receive a signal or lamp post.

To conserve wood, it is quite practicable to use old cardboard boxes, match boxes, screwed-up newspapers or other 'bulking' underneath sacking or hessian, applying either papier mâché or plaster of paris on top of this substructure.

It must be remembered that one single sheet of brown paper is not sufficiently strong to support wet plaster or papier mâché unless it has been first size-coated, dried, and painted, the modelling material being applied after the paint is set hard.

Cover Treatment

All modelled structures, whether of papier mâché or plaster are not waterproof unless they are painted, or at least, shellac varnished after they are hard set, and the unseen bases of such models must always be so treated to prevent moisture creeping up from below.

For outdoor scenic modelling there is nothing to beat cement, which may be either worked into shape or cast in an oiled mould of quite rough make. It may be coloured by the addition of dry paint colours, these being readily obtainable at any ironmonger's store.

The very frailest of substructures may be very thinly covered with 'washy' cement, which, when dry, can be again covered by successive layers, each of which will increase the strength of the model 'hill' until it can be stood upon if desired; such will be the strength of the finished model.

Ponds and Lakes

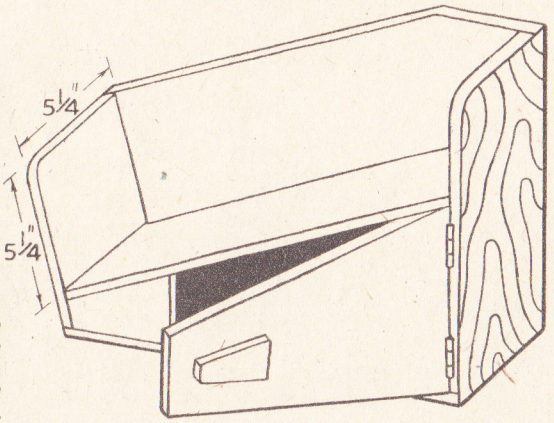
Ponds and lakes may be imitated—on indoor model lines, by sheets of 'hammered' glass (Muranese glass will do, but is not quite so realistic). The back of the sheet should be painted with a 'smudge' paint of greenish-brown tint, and the surface should be streaked and stippled with emerald green paint to give the effect of floating water weeds.

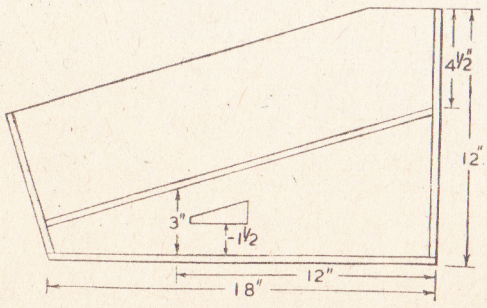
Should your railway layout include a dock-side scene, it must be remembered that even a small liner of, say, 350ft. length would be represented in 4mms. scale ('OO') by a model some 4ft. 6ins. long, so that your models of ships should be confined to barges, tugs, lighters or small oil tankers, which are of smaller size and will fit into the railway picture more unobtrusively. Such models are often procurable at reasonable prices as water-line models.

Novel Bookstand and Cupboard

EASILY constructed of ⅜in. wood this novel bookshelf is designed to prevent untidiness which occurs when books are removed from a bookshelf of the usual type. The books are placed on a sloping shelf and are kept in position by their own weight. The cabinet part can be used for stationery and two of these bookshelves placed end to end would make a useful addition to any writing desk. In this case the second one would have to be made the opposite way round with the shelf sloping towards the right.

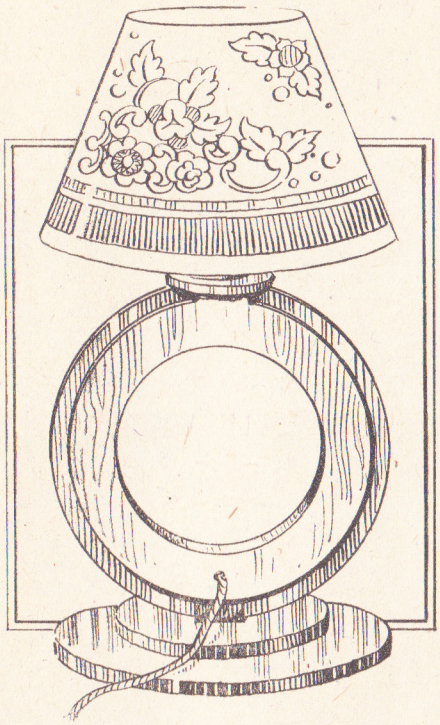
If large books are to be accommodated the depth should be increased from 5¼ins. to 7ins.





Another idea for an attractive

NOVELTY TABLE LAMP



IF not wanted for personal use, the novelty lamp illustrated here would make a very acceptable gift for a friend. It is quite easy to make, and the work of construction is plain and straightforward. Some pieces of good quality wood such as mahogany or oak would be suitable, and it will be found two of Hobbies panels of wood H4 will be sufficient to make the whole thing.

The pattern for two main parts of the lamp is shown within the limits of one panel, the second panel being used for a second covering piece (A) and the base.

Now the novelty of the lamp lies in its method of make up, the flex leading up to the lamp socket being hidden in a groove within the three layers or circles of the frame.

A study of the illustrations before a start is made on the work will be sufficient to make the method clear. Two circles of ¼in. wood are wanted as (A), in Fig. 1, the central inner disc (C) of one when cut round and removed will answer for the upper layer of the base, see Fig. 2, which gives a cross section of the base made up of the two pieces.

The larger piece as (B) on the panel in Fig. 1 is 6½ins. diameter, with a disc 4ins. diameter cut from the middle in a similar manner to (A). From this latter piece two smaller discs are cut and glued to the frame. The disc shown 2ins. diameter will be glued at the top of frame (B), and over the tenon, and the smaller disc, 1⅜ins. diameter will be screwed on top of this disc with a hole in the middle for the flex to protrude, and follow up to the lamp holder.

Centre Disc

Particular care must be taken in making the centre disc or frame piece (B) to get the slot carefully cut. An inner margin of wood (E) ⅜in. wide will be left and an open space or channel (F) ¼in. then marked which will leave an outer margin of ⅝in. Support the pieces well on the cutting table during cutting.

When the two side layers (A) are glued on, the piece (G) will be held securely. See that an even margin is kept all round in the gluing on, then round off the edges of the projecting inner disc. A small cross section of the three pieces is given in Fig. 3, the near side piece (A) being drawn away to adequately show the groove or channel in the middle section.

Now glue on the 2in. disc, and glue on the base to the tenon below, adding the small cover blocks each side to strengthen the joint at this place. So that the flex may emerge from the bottom of the ring, bore a hole in one side piece immediately opposite the swelling of the channel at the bottom.

Finish

Finish all edges and surfaces with glasspaper and round off the sharp edges where necessary. The wood may now be finished either with stain and varnish or coloured art enamel.

If a more or less common wood has been used then paint or enamel would make a good finish as any open joints will be well covered and should not be apparent in the finished article.

If mahogany has been used, french polish would look well, or again this wood may be lightly stained and then rubbed up with oil.

When the work of polishing or painting has been completed and all surfaces are quite hard, remove the top circular disc, which has been screwed in place.

Get a length of flex, sufficient to reach from the table to the nearest point from which the lighting is to be made, plus what will be required for the lamp itself. Push this through the hole in the ring, draw enough through to go round the channel and come out at the top. Thread the flex through the hole in the disc and then replace the latter by screwing it on.

The Fitting

Now screw the short brass barrel or sleeve of the holder in the hole in the top disc and draw the flex further through to connect up with the actual bulb holder. Draw the flex back from below to take up any slack in the groove. To the lower free end of the flex connect an adaptor ready for plugging in.

The shade support, Fig. 4, consists of a 2in. square of tin or thin brass, with a hole cut out of the centre, as shown. To this are soldered four bent wires which support the shade. Any stiffish wire will answer for these, and one of them is shown already in place in the illustration. Draw the outline of the wire on paper, getting the angle as far as possible correct.

(*Continued foot of page* 330)

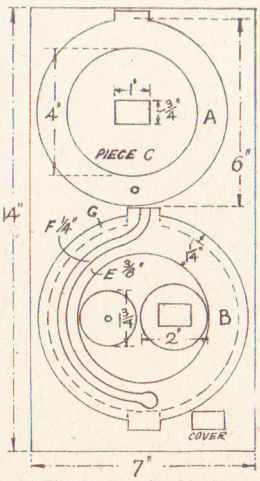


Fig. 1—Detail of parts

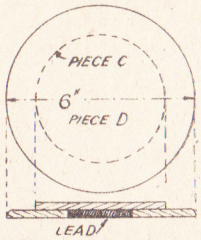


Fig. 2—Base section

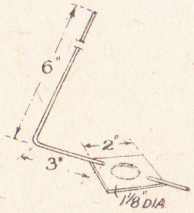


Fig. 4—The support

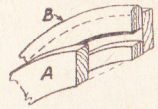


Fig. 3—The rims

Fig. 5—Shade shape

How the handyman with a family can make

A CRIB FOR BABY

THIS baby's crib can be made at a remarkably low cost and can prove snug and draught resisting for a young baby up to six months or more.

The entire crib consists of a steel frame 31½ins. by 17ins., canvas or strong fabric in three pieces. There are, one piece 59ins. by 19ins., two pieces 33ins. by 13ins. and trestle of four 3ft. lengths of wood 1¼ins. by ½in. and four of 19in. lengths 1½ins. by ¼in.

To begin making our crib, we first provide a frame 31½ins. by 17ins. We have two choices of frame. First a perambulator frame of the above dimensions is quite common and considered the better frame, as it already has fitted bolts to take trestle, but where both halves join, a short strip of steel bolted either side keeps frame rigid. If perambulator frame should be unobtainable, a frame can be made from strip steel ½in. by ⅛in. and bent into

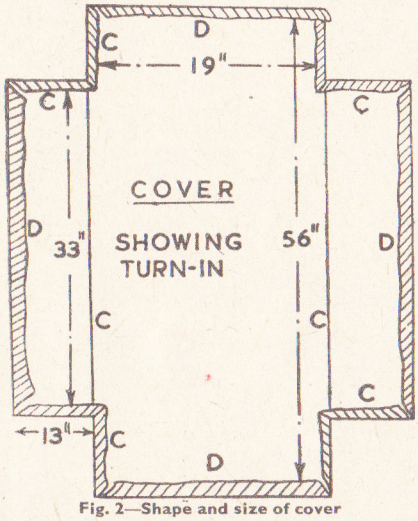


Fig. 2—Shape and size of cover

length and breadth shown and can be either joined by welding or bolted together by small steel strips.

Our next move should be the cover (Fig. 2). This probably calls for the sewing machine or a lady for stitching, which is found to be stronger when machine stitched. Our three pieces of canvas, one 59ins. by 19ins. and two 33ins. by 13ins. are now assembled and ready for stitching, allowing approximately 1in. turn-in (Fig. 2, C).

The reason for three pieces of canvas or fabric as the case may be, is that it is found to work out much cheaper and easier to obtain than a complete piece. Presuming three pieces are joined together, corners brought in and joined, we proceed to bind, cover edge to frame, frame shown (Fig. 3, A) and overlap (Fig. 3, D). This is found to be stronger when done in a blanket stitch, thus pulling 1in. overlap around frame tightly and blanket stitching. Nick small holes for trestle bolts on the frame (Fig. 3, B) and button-hole stitch these.

This should complete crib, but before we start our trestle, check on what is already done to assure ourselves that the trestle will work in conjunction with our

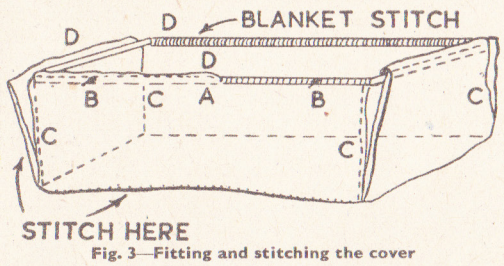


Fig. 3—Fitting and stitching the cover

crib. The width and length of the crib is 33ins. by 17ins. and depth approximately 12ins.

This completed, we begin on the trestle, by providing our four 3ft.

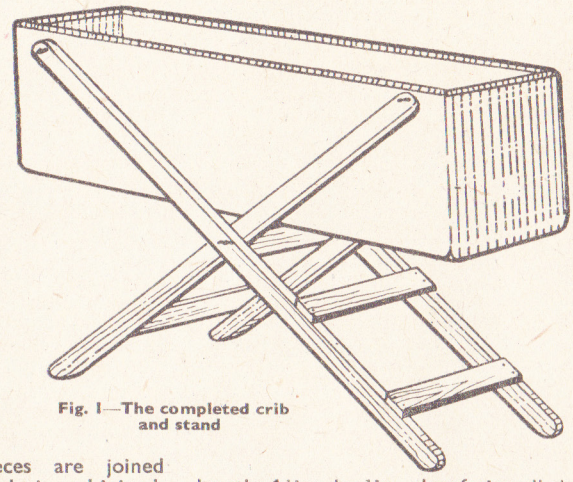


Fig. 1—The completed crib and stand

lengths 1¼ins. by ½in., chamfering all the ends as shown in Fig. 1. This saves the carpet from being scratched and at the top gives better effect. This done we now fit our cross sections of 33ins. by 1½ins. by ½in. Four of these are required. For the bottom sections cut indents ½in. deep and 1½ins. width in trestle legs. Do likewise for the top cross section pieces, 9ins. apart from bottom cross section pieces. Use a good glue and also screw down with fine ½in. wood screws. Four of these are sufficient in each cross section piece. Join trestle legs together by boring ¼in. holes in the centre of the legs and bolt together with 1½ins. long by ¼in. diameter bolts. Also ¾in. from the top of the trestle legs bore ¼in. holes to take crib bolts. These bolts can be fitted with butterfly nuts to enable easier dismantling.

A mattress for this size of crib is easily obtainable and a useful addition to the crib would be a canopy made from ⅛in. wire and secured to bolts on frame. (335)

Lamp—(*Continued from page 329*)

See that both wires are alike, then solder them to the corners of the metal square. The support is then fitted to the lamp holder, the brass ring on it being unscrewed, the square dropped over it, and the ring then replaced.

A pattern must be made for the shade if this is not to be bought ready-made.

The shade may be of parchment paper or other suitable material.

The pattern is easily developed according to the diagram Fig. 5.

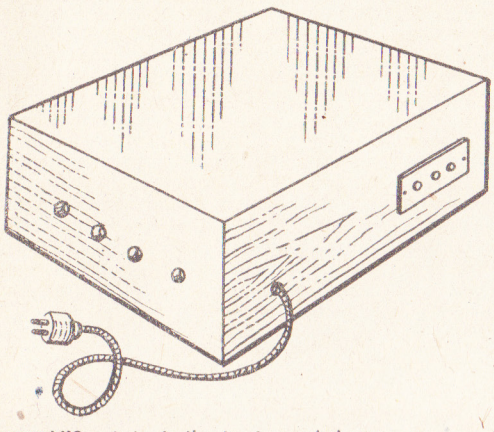
First draw line (A—B), then the centre line and line (C—D). Connect these points and extend them to centre (E). From here, and with radii (E—D) and (E—B), respectively, strike the arcs (D—F) and (B—G). In the centre of line (C—D), strike a 3in. diameter circle. Divide this into eight parts and measure off these parts on to arc (D—F).

From centre (E), draw (E—G). Allow ¼in. for overlap or gluing tab and cut out. Bend the material to shape and glue the tab or this may be punched with holes and stitched if so desired.

The finished decoration can be left to the worker. Some, with artistic ability can paint the shade with special paint or stains, and a type of floral design, easy to outline and colour in with a fine brush is given in the illustration.

For the battery type receiver you can make an

A.C. RADIO ELIMINATOR



THIS unit is similar in size and shape to a high tension dry battery, and takes the place of the latter in operating a battery-type radio receiver, deriving current from the A.C. mains. Its cost is a little higher than that of a new good-quality H.T. battery, but it is, of course, almost everlasting. The current actually taken from the mains is extremely small, and many years of trouble-free operation should be obtained from the unit.

A transformer is used in the circuit, and this isolates the output from the mains, thereby guarding against the possibility of mains shocks.

The Transformer

The primary of this should be suitable for the house mains, which will usually be 230 to 250 volts, 50 cycles, A.C. The unit is not suitable for direct-current mains. (The latter require no transformer or rectifier, but additional care in other directions). It does not matter in the least if the primary is slightly underrun.

For example, a 250 volt transformer may be employed on 230 or even 200 volt mains. Over-running the transformer is not recommended, as it may become hot or be damaged, so the primary should not be designed for a *lower* voltage than the mains supply.

A secondary delivering about 150 volts is convenient. If the secondary gives less voltage, the output of the eliminator will be proportionately reduced. On the other hand, if the transformer delivers a much higher voltage, the output of the unit would be too high, and it would be necessary to wire a small resistor in series with the rectifier, to reduce the voltage.

Battery type valves used in receivers operated from 2 volt accumulator for filament supply should not receive more than 150 volts as high tension. Where a midget all-dry set is concerned, the maximum H.T. voltage is normally 90, but, in a few cases, 67. This must, therefore, be remembered, and the output of the eliminator reduced, if necessary, by adding a resistor, as will be explained.

The current consumption of the average battery set is not likely to exceed 15 milliamps, and may be much less, so one of the small transformers capable of delivering up to 25 milliamps is suitable. If the transformer is capable of giving a higher current, this does not mean it is unsuitable, but merely that it will not be fully loaded.

High Tension Rectifier

This is of the metal half-wave type, and one capable of handling up to about 25 milliamps at 150 volts or less, will cost only a few shillings. Note that the positive end marked in red or with a cross, is taken to the smoothing choke.

Some voltage drop will arise in the rectifier, depending upon its type and the amount of current taken. Its purpose is to allow current to flow one way only, thereby changing the A.C. from the transformer to direct-current, which is smoothed by the choke and condensers.

Smoothing Choke

Any small smoothing choke is suitable, because it will not be called upon to pass much current. A large expensive choke is not really required. Its purpose is to take the ripple out of the current coming from the rectifier, which would cause loud humming from the receiver. The higher its inductance, the more ably it will do this. The inductance is expressed in Henrys, and 5 to 10 Henrys is average. Such a choke will have a direct current resistance of around 500 ohms or so, and thus cause a further voltage drop.

As the circuit is not critical, any smoothing choke to hand can be tried, and will probably prove suitable. For very small sets, an old coupling transformer can be used. Connect to the two primary terminals in this case. The winding on a transformer will, however, be insufficiently robust for the current required by a larger receiver.

Smoothing Condensers

These are shown as C1 and C2, and will normally be 8 mfd. components. If electrolytic, they must be connected in the correct polarity, positive going to the choke and rectifier, and negative to H.T. negative. With smaller sets, condensers down to 2 mfd. can be used satisfactorily. However, 8 mfd. condensers are quite cheap.

If condensers of too small capacity are used, humming will mar reproduction. Occasionally values as high as 32 mfd. are used for C2, but in practice this scarcely seems to make a noticeable improvement over an 8 mfd. component.

Condenser C3 is really to by-pass H.T.1 to H.T. negative, and can be a 1 or 2 mfd. paper type condenser. If the receiver does not require this intermediate tapping, it can be omitted, together with the resistor R.

Building Details

After screwing down the parts, wire up as shown in Fig. 2. For the mains supply leads, use good quality twin flex, fitted with a proper mains plug.

The size may depend upon the actual components, but a base of about 5ins. by 7ins. should prove amply large. Unless the transformer is high, the front strip can be about 3ins. deep, and a complete box should be made in such a way that it can be placed over the base and front, and screwed in position. Two rows of ¼in. holes are drilled for ventilation.

A small socket strip is screwed as shown, so that the plugs on the receiver battery-cable can be inserted. Keep the choke and transformer as far apart as possible.

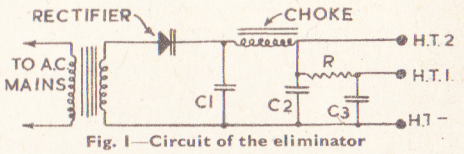


Fig. 1—Circuit of the eliminator

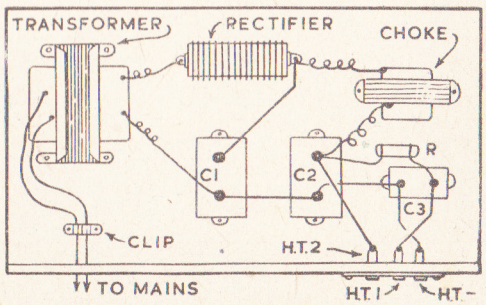


Fig. 2—The complete wiring diagram

Voltage Adjustment

The voltage output, particularly at H.T.1, will depend on the current taken. For example, if tested by a high-resistance meter, with no receiver connected, H.T.1 may be 120 volts or more, and H.T.2 even higher, but these may drop to 60 volts and 120 volts or less, when the receiver is taking current.

Fortunately most receivers are not in any way critical, as regards H.T. voltage,

and the voltage can easily be adjusted, if necessary.

Resistor R will drop 10 volts for each 10,000 ohms of its value, if 1 milliamp flows (a usual figure for detector valves, which are usually supplied with about 60 volts). Assuming that H.T.2 will be about 120 volts, then, a 60,000 ohm resistor is used, and in most cases this will be quite satisfactory.

If violent oscillation shows too much voltage is reaching the detector, use a resistor of up to 100,000 ohms or so, or connect a further resistor in series with that already present. It is also possible to use a variable resistor, so that this can be set to the required value.

If the voltage at H.T.2 proves too high, connect a resistor between the choke and C2. Here, about 10 milliamps will flow, with average 3 valve sets, so the resistor will drop 10 volts for every 1,000 ohms of its value. Again, a variable resistor is possible, but scarcely necessary, except for experimental purposes.

Measuring Voltage

If a good voltmeter is to hand, it is easy to measure the output at the sockets, with the receiver actually working, and to arrive at the figure required. Otherwise, the user can tell with sufficient accuracy by judging how the receiver works, as compared with the H.T. battery previously employed. Low voltages will show themselves by weak reproduction. Excessive voltage will cause oscillation and howling.

With a unit of this type, it is useless to measure the voltage at the sockets by means of the cheap meters which consume a high current. With these, the current drawn by the meter may reduce the voltage to such a low figure that scarcely any reading is obtained, yet when the meter is disconnected, the unit will work the receiver properly. This cannot be overcome, and arises in testing all circuits where high resistance is present. The remedy is to use a proper radio testmeter drawing an extremely small current, when accurate readings will be obtained.

Extra Sockets

Some old sets have many plugs, but some of these can usually be connected to a common supply voltage. If extra sockets are *essential*, these can be obtained by connecting a further resistor from C2 to the new socket, and wiring a 1 or 2 mfd. condenser from the latter to H.T. negative, as with the intermediate socket already present in Fig. 2.

Finally, see that the usual grid bias battery is used, and plugs inserted in suitable sockets, as the voltage here will have a considerable influence upon the volume and quality of reproduction obtained.

Some electrical problems solved in readers'

REPLIES OF INTEREST

Electrifying Rails

IS it possible for me to electrify the rails of a clockwork set so that it will be possible to use the electric train? I also require a transformer for the train, so could you possibly give me any information on this at the same time? (D.M.—Corby).

THE current pick-up for an electric train is obtained from the wheels and a centre shoe which runs on an insulated rail placed centrally between the rails upon which the wheels run. It might be possible to add this third rail by fixing small bolts to the sleepers, using insulating washers for each, and soldering lengths of 14 S.W.G. or similar straight stiff wire to the bolt heads, but a sound job should be made if the train is to run properly. Take one connection to centre rail and other to usual rails. If the engine has a wound field, it will operate from a mains transformer, the primary of this being suitable for the house mains. It is understood engines have been made with 6 and 20 volts motors. It would be wise to try 6 volts, increasing this if the motor does not run. Dry batteries are unsuitable, but an accumulator could be used. Transformers will not function on D.C. mains. If the engine motor has a permanent magnet, it will not function from a transformer with A.C. mains, and batteries must be used.

* * *

Battery Charging

I WANT to charge batteries with D.C. current. How do I go about it? (H.L.—Portadown).

CHARGING from D.C. is very easy, and the polarity will be found marked on the mains-supply plugs or sockets. The connections to use are as follows:—Positive mains socket to mains-type lamp-holder. Second lamp-holder screw to Positive on accumulator to be charged. Negative of accumulator to Negative mains socket. The charging rate in amps can be found by dividing the mains supply voltage by the wattage of the lamp in the holder. For example—240 v. mains and 120 watt lamp equals ½ amp. Usually the circuit may be arranged to make use of a lamp already employed for some useful purpose. If more than one battery is to be charged, connect batteries in series, Positive on one going to Negative on the next, and so on. Do not handle any bare leads or other connections without first withdrawing the mains plug to disconnect supplies.

* * *

Radio Controlled Models

I AM enquiring if you could supply me with data on a radio-controlled boat model. (F.D.H.—Ferryhill).

FOR radio control of models, a minimum of 2 to 3 valves are required in the transmitter, and a similar number in the receiver; both must work on one of the frequencies allocated by the G.P.O. To set up the circuits satisfactorily, a fair working knowledge of wireless is desirable. The transmitter can consist of any radio frequency oscillator working on the assigned frequency (preferably crystal controlled to prevent any chance of the circuit straying on to other frequencies), followed by one or two radio frequency amplifiers. The normal method of control is to provide oscillators which enable the radiated signal to be modulated with audio-frequency tones, one for each item to be controlled in the model. The receiver consists of a detector and one or more amplifying stages, with filter circuits permitting the audio-tones to pass to individual relays, which open or close according to whether the appropriate tone is transmitted, thereby switching motors which drive the model or operate rudder, etc. (Occasionally rudder is controlled by electro-magnets similarly operated). The normal range of operation would be up to a few hundred feet, depending upon amount of amplifiation, number of valves, etc. At present the G.P.O. is only permitting such operation on micro-waves and ultra-short waves, and the Postmaster General should be written, enquiring what frequencies may at the moment be adopted to ensure illegal transmission does not take place.

* * *

Pick-up Addition

MY AC/DC radio has no pick-up sockets. Can you tell me how to fix them? (R.T.M.—East Ham).

TO connect the pick-up you will need to take two leads to the receiver. One should go to the metal chassis. The other will require to go to the grid socket of the output valve, or to the grid socket or cap of the valve preceding the output valve. (Each can be tried, to determine which is best with the particular receiver). As you do not give sufficient details of the valve-types it is not possible to state which is the correct socket. This may be found from valve lists, by following the receiver wiring, or by having a local radio shop indicate the points in question. If it is desired to ensure no mains voltages reach any metal parts of the pick-up, a condenser of about ·1 mfd. may be connected in series with each pick-up lead.

The amateur handyman should know these

HINTS ON FILING METALS

TO deal fully with metal filing is beyond the scope of an ordinary article, but the few hints here described will be found very useful.

For a guide where a piece of work requires heavy or rough filing, a file with fairly coarse cut teeth should be used. The method of rough filing metal is described in the following manner with the aid of view (A) Fig. 1, of the accompanying illustrations.

Much depends upon how the file is held if the work of heavy filing is to be done with more or less ease. The left hand should grip the end of the file, as indicated in view (A) Fig. 1, and the right hand should firmly grip the handle. When filing do not use the file in a see-saw manner, take firm strokes, keeping the file flat and use pressure and force in a forward direction indicated by the arrow. Relieve the pressure and force on the backward stroke, simply allowing the file to trail over the surface of the work.

For light filing a slightly different application is needed if the work is to be a success. A file with medium cut teeth is used for light filing, and the file is held at the end with the grip made by the thumb and finger tips, as indicated by view (B) Fig. 1. Use less force and pressure as applied for heavy filing, but the required pressure is made likewise on the forward stroke in the direction of the arrow.

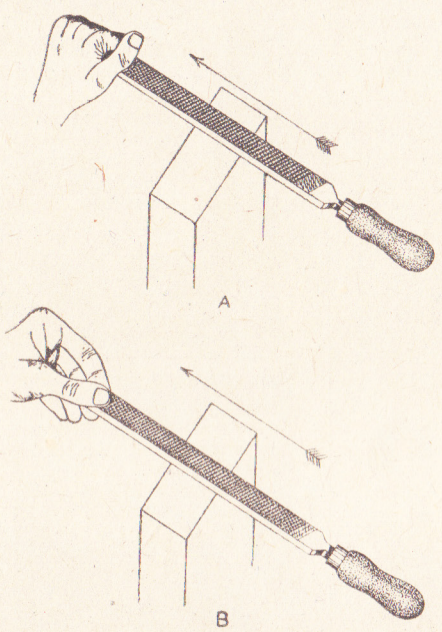


Fig. 1—Heavy and light filing

Light filing is done after heavy filing in order to get the coarseness of the surface reduced, and at the same time making quite sure it is made true to the square.

Finish filing is done with a fine cut or smooth file, and the file should be lightly held. The fingers of the left hand are simply held on the end of the file, as indicated in view (C) Fig. 2. Hold the file lightly by the handle, and like the previous cases, the cutting is done in the forward direction indicated by the arrow. Only very slight pressure should be applied, and the file should be lifted slightly off the work on the backward stroke.

In some cases mechanics finish off the surface of metal by a method known as drawfiling. A smooth cut file is used for drawfiling, and the file is held in the manner indicated in view (D) Fig. 2. Keep the file quite flat on the work, and with even light pressure draw it along the surface forward and backward in the direction indicated by the arrows.

Unlike previous filing operations already described, the pressure is maintained on the forward and backward strokes, the file being allowed to cut in both directions. When the surface is treated with the file it is the usual practice to finish it off with fine grade emery cloth, the cloth being folded round the file and the work done in a drawfiling manner.

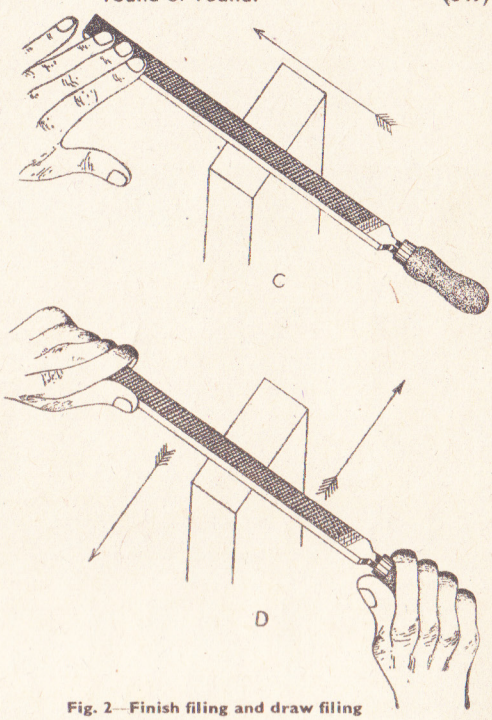


Fig. 2—Finish filing and draw filing

Two further hints on filing may be of interest to many readers, and these deal with filing out holes and curves in metal. The method of enlarging a hole is described with the aid of view (E) Fig. 3. The end of the round file is best held as indicated in view (B) Fig. 1, the handle being gripped in the usual manner. Commence filing the hole with firm forward strokes in the direction of the arrow, and at the same time turn the file in a clockwise direction as indicated by the curved arrow.

Practice the art of keeping the file square with the work and remember to take off pressure on the backward stroke. Whenever possible it is better to slightly change the position of the work in the vice, in order to keep the pressure on the metal during filing the hole.

When filing out a curve as indicated in view (F) Fig. 3, the method is the same as described for filing a hole. The work of filing a curve, however, is usually done with a half-round file, although with practice quite good results can be obtained with either half-round or round. (349)

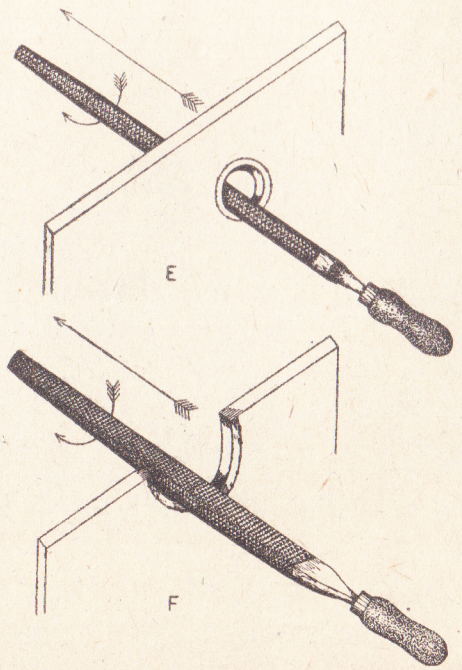


Fig. 3—Filing holes and curves

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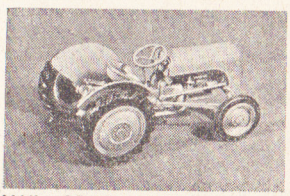

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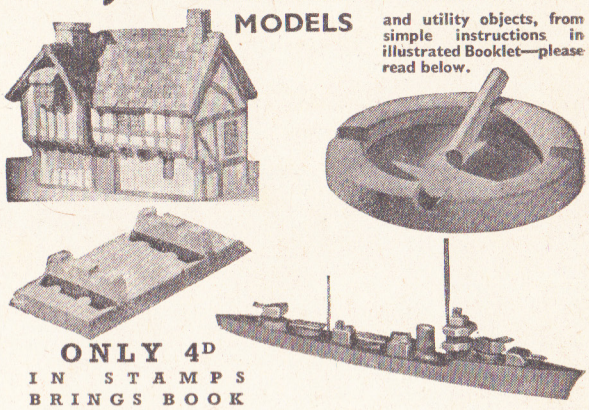

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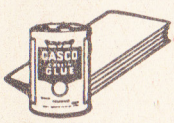

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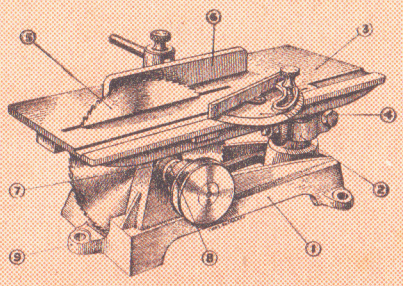
5. Thicker 6in. diameter saw blade to prevent flexing under side pressure.
6. Adjustable fence of improved design with positive locating device.
7. Phosphor bronze bearings.
8. Ground Spindle.
9. Stouter three point mounting.



Note also that direction of saw now clockwise to take advantage of greater length of table and provide greater protection as saw now working behind the pillar supporting the table instead of in front of it.

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'. . . a cabinet maker . . . will do . . . a lot of work normally . . . have to do by hand'.

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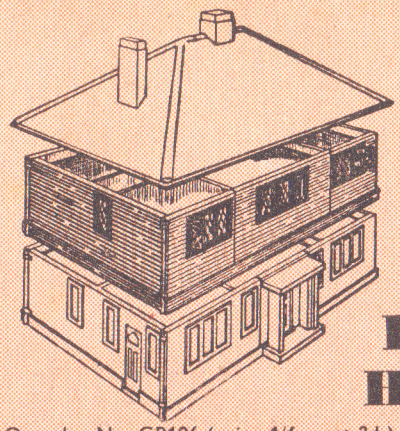

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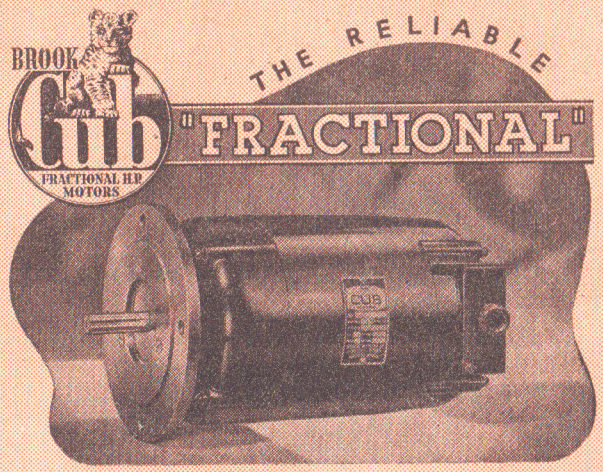

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